

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

In the claims:

1. (Original) A rotary die apparatus comprising:
a base;
a plurality of elongate columns, each column having a first end and a second end defining a first axis of movement along a length thereof, the first end of each column removably mounted to the base in spaced relationship to one another;
at least one cross member moveably engaged with respect to at least two of the plurality of columns for movement along the first axis;
at least one first modular die support removably mounted to the base;
at least one second modular die support removably mounted to the cross member; and
at least one die having an axis of rotation, the die positioned between the base and the cross member in rolling engagement with at least one of the first and the second modular die supports.
2. (Original) The apparatus of claim 1 wherein the at least one die further comprises:
a first rotary die having a first axis of rotation, the first die in rolling engagement with the first modular die support; and
a secondary rotary die having a second axis of rotation, the second die in rolling engagement with the second modular die support, the second die positioned with the second axis of rotation in substantially parallel alignment to the first axis of rotation of the first die.
3. (Original) The apparatus of claim 2 wherein the first die is in rolling engagement with the second die.
4. (Original) The apparatus of claim 3 wherein the first rotary die further comprises a first end surface and an opposing second end surface, the first die

3

having a radially raised flange adjacent to at least one of the first and the second end surfaces.

5. (Original) The apparatus of claim 4 wherein the raised flange operably engages the first modular die support to limit linear translation of the first die along the first axis of rotation.

6. (Original) The apparatus of claim 4 wherein the raised flange operably engages the second die to limit linear translation of the second die along the second axis of rotation.

7. (Original) The apparatus of claim 1 wherein the cross member further comprises a first cross member and a second cross member, the first and second cross members positioned on opposing columns in spaced relationship with respect to one another.

8. (Original) The apparatus of claim 1 further comprising a pressure member operably engaged with the cross member for selectively adjusting the position of the cross member along the first axis of movement.

9. (Original) The apparatus of claim 1 wherein at least one of the first and the second modular die supports further comprise at least two rollers having axes of rotation substantially parallel to one another and angularly spaced from one another from the axis of rotation.

10. (Original) The apparatus of claim 1 wherein the die further comprises a first end surface and an opposing second end surface, the die having an elongate journal extending from at least one of the first and second end surfaces along the axis of rotation; and

at least one of the first and second modular die supports comprising a cylindrical roller bearing, the roller bearing operably engaged with the journal permitting free rotation of the die about the axis of rotation.

11. (Original) The apparatus of claim 10 further comprising at least one spacer positioned between the first and the second modular die supports.

12. (Currently amended) A rotary die apparatus comprising:
a frame having a base, a plurality of elongate circular columns having a first end and a second end defining a first axis of movement along a length thereof, the first ends of the columns removably mounted to the base and the second ends of the columns removably mounted to a cover, at least one cross member moveably engaged with respect to at least two of the plurality of circular columns for movement along the first axis;

a first rotary die having a first axis of rotation, the first die having a first end surface and an opposing second end surface and at least one raised radial flange adjacent at ~~least~~ least one of the first and second end surfaces;

a second rotary die having a second axis of rotation positioned in substantially parallel alignment with the first axis of rotation and in rolling engagement with the first die, the second die in operable engagement with the radial flange of the first die to limit linear translation of the second die along the second axis of rotation;

a first modular die support removably mounted to the base, the first die support having a first bearing member and a second bearing member separated from the first bearing member along the first axis of rotation, the first and second bearing members having at least two rollers having axes of rotations substantially parallel to one another and angularly spaced from one another from the first axis of rotation, at least one of the first and second bearing members in operable engagement with the raised radial flange to limit movement of a first die along the first axis of rotation; and

a second modular die support removably mounted to the cross member, the second die support having a first bearing and a second bearing member separated from the first bearing member along the second axis of rotation, the first and second bearing members having at least two rollers having axes of rotation substantially parallel to one another and angularly spaced from one another from the second axis of rotation.

13. (Original) An improved rotary die apparatus having a base, a plurality of elongate columns extending from the base, a cover opposite the base engaged with the columns, a cross member moveable between the base and the cover and a pressure member operably engaged with the cover and the cross member for selectively positioning the cross member on the columns, the improvement comprising:

a first modular die support removably mounted on the base in rolling engagement with a first die permitting free rotation of the first die about a first axis of rotation; and

a second modular die support removably mounted to the cross member in rolling engagement with the second die permitting free rotation of the second die about a second axis of rotation.

14. (Original) The apparatus of claim 13 wherein the first die further comprises:

a raised radial flange adjacent at least one of a first and a second opposing end of the first die, the radial flange in operable engagement with the first modular die support to limit linear translation of the first die along the first axis of rotation.

15. (Original) The apparatus of claim 14 wherein the second die operably engages the radial flange of the first die to limit linear translation of the second die along the second axis of rotation.

AM

16. (Original) The apparatus of claim 13 wherein at least one of the first and second modular die supports comprises at least two rollers having axes of rotation substantially parallel to one another and angularly spaced from one another.

17. (Original) The apparatus of claim 13 wherein at least one of the first and second modular die supports further comprises at least one cylindrical roller bearing for rolling engagement with a journal on at least one of the first and the second dies.

Claims 18-35 (withdrawn).

36. (New) The rotary die apparatus of claim 1 wherein the plurality of columns comprise four columns.

37. (New) The rotary die apparatus of claim 1 wherein the elongate columns are uniform in cross section along the length.

38. (New) The rotary die apparatus of claim 12 wherein the plurality of columns comprise four columns.

39. (New) The rotary die apparatus of claim 12 wherein the elongate columns are uniform in cross section along the length.

40. (New) A rotary die module for use with a first rotary die having a first axis of rotation and a second opposing rotary die having a second axis of rotation, the rotary die module comprising:

a base;

a plurality of elongate columns having a first end and a second end defining a first axis of movement along a length thereof, the first ends of the columns

removably mounted to the base in spaced relation to one another, the second ends removably mounted to a cover;

at least one cross member movably engaged with respect to at least two of the plurality of columns for movement of the cross member along the first axis of movement;

a first modular die support removably attached to the base adapted to receive and rotatably engage a first rotary die;

a second modular die support removably attached to the cross member adapted to receive and rotatably engage the second rotary die; and

a pressure member engaged with the cover and the cross member for controlling movement of the second modular die support along the first axis of movement.

41. (New) The rotary die module of claim 40 wherein the plurality of columns comprise four columns.

42. (New) The rotary die module of claim 41 wherein the columns are uniform in cross section along the length.

43. (New) The rotary die module of claim 40 wherein the at least one cross member comprises two cross members positioned in opposing relation to one another and positioned on opposing columns.

44. (New) The rotary die module of claim 40 wherein at least one of the first and the second modular die supports further comprises at least two rollers having axis of rotation substantially parallel to one another and angularly spaced from at least one of the first axis of rotation and the second axis of rotation.

8

AD 45. (New) The rotary die module of claim 40 wherein at least one of the first and the second modular die supports further comprises at least one cylindrical roller bearing operably engaged with a journal on at least one of the first and the second rotary dies.
